

### ABSTRACT OF THE DISCLOSURE

[00123] A method and system for bidirectional bitwise constant propagation by abstract interpretation is disclosed. In one embodiment, the method performs optimizing an implementation of a programming language, comprising; analyzing one or more values computed by a program written in the programming language, wherein analyzing one or more values comprises; representing each bit within a value of the one or more values as an abstract element of a lattice having a set of abstract elements including  $0_A$ ,  $1_A$ ,  $\perp_A$  and  $T_A$ , wherein the lattice is an abstraction of a concrete domain containing 0, 1, and  $\perp$ ; analyzing one or more output bits that are produced by an operation in terms of one or more input bits that are input to the operation; and analyzing the input bits that are input to the operation in terms of the output bits that are produced by the operation.

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